WHAT IS CLAIMED IS:

1. A noise suppression system comprising:

an array microphone comprised of a plurality of microphones and operative to provide a plurality of received signals, one received signal for each microphone, wherein the plurality of microphones include at least one omni-directional microphone and at least one uni-directional microphone;

at least one voice activity detector operative to provide first and second voice detection signals based on the plurality of received signals;

a reference generator operative to provide a reference signal based on the first voice detection signal and a first set of received signals selected from among the plurality of received signals;

a beam-former operative to provide a beam-formed signal based on the second voice detection signal, the reference signal, and a second set of received signals selected from among the plurality of received signals, wherein the beam-formed signal has noise and interference suppressed; and

a multi-channel noise suppressor operative to further suppress noise and interference in the beam-formed signal and provide an output signal.

2. The system of claim 1, wherein the reference generator is operative to provide the reference signal having substantially noise and interference, and wherein the beam-former is operative to suppress the noise and interference in the beam-formed signal using the reference signal.

3. The system of claim 1, wherein the reference generator includes a first set of at least one adaptive filter operative to filter the first set of received signals and an intermediate signal from the beam-former to provide the reference signal, and wherein the beam-former includes a second set of at least one adaptive filter operative to filter the second set of received signals and the reference signal to provide the beam-formed signal.

4. The system of claim 1, wherein the reference generator and the beam-former are operative to perform time-domain signal processing.

5. The system of claim 1, wherein the multi-channel noise suppressor is operative to perform frequency-domain signal processing.

6. The system of claim 1, wherein the multi-channel noise suppressor is operative to derive a gain value indicative of an estimated amount of noise and interference in the beam-formed signal and to suppress the noise and interference in the beam-formed signal with the gain value.

7. The system of claim 1, wherein the estimated amount of noise and interference in the beam-formed signal is determined based on the reference signal, the beam-formed signal, and the output signal.

8. The system of claim 1, wherein the at least one voice activity detector includes a first voice activity detector operative to provide the first voice detection signal based on the first set of received signals.

9. The system of claim 8, wherein the first voice detection signal is determined based on a ratio of total power over noise power.

10. The system of claim 8, wherein the at least one voice activity detector further includes a second voice activity detector operative to provide the second voice detection signal based on the second set of received signals.

11. The system of claim 10, wherein the second voice detection signal is determined based on a ratio of cross-correlation between a desired signal and a main signal over total power.

12. The system of claim 8, wherein the at least one voice activity detector further includes a third voice activity detector operative to provide a third voice detection signal based on the reference signal and the beam-formed signal, and wherein the multi-channel noise suppressor is operative to suppress noise and interference in the beam-formed signal based on the third voice detection signal.

13. The system of claim 12, wherein the third voice detection signal is determined based on a power ratio of the beam-formed signal over a reference noise signal.

14. The system of claim 1, wherein the array microphone comprises one omni-directional microphone and two uni-directional microphones.

15. The system of claim 14, wherein the omni-directional microphone is designated as a main channel and the two uni-directional microphones are designated as secondary channels.

16. The system of claim 14, wherein one of the two uni-directional microphones faces toward a voice signal source and the other one of the two uni-directional microphones faces away from the voice signal source.

17. The system of claim 16, wherein the first set of received signals includes a main received signal from the omni-directional microphone and a first secondary received signal from the uni-directional microphone facing toward the voice signal source, and wherein the second set of received signals includes the main received signal and a second secondary received signal from the uni-directional microphone facing away from the voice signal source.

18. The system of claim 1, wherein the array microphone comprises one omni-directional microphone and one uni-directional microphone.

19. The system of claim 18, wherein the uni-directional microphone faces toward a voice signal source, and wherein the first and second sets of received signals both include a main received signal from the uni-directional microphone and a secondary received signal from the omni-directional microphone.

20. An apparatus comprising:

means for obtaining a plurality of received signals from a plurality of microphones forming an array microphone, wherein the plurality of microphones include at least one omni-directional microphone and at least one uni-directional microphone;

means for providing first and second voice detection signals based on the plurality of received signals;

means for providing a reference signal based on the first voice detection signal and a first set of received signals selected from among the plurality of received signals;

means for providing a beam-formed signal based on the second voice detection signal, the reference signal, and a second set of received signals selected from among the plurality of received signals, wherein the beam-formed signal has noise and interference suppressed; and

means for suppressing additional noise and interference in the beam-formed signal to provide an output signal.

21. The apparatus of claim 20, wherein the plurality of microphones include one omni-directional microphone and two uni-directional microphones, and wherein one of the two uni-directional microphones faces toward a voice signal source and the other one of the two uni-directional microphones faces away from the voice signal source.

22. A method of suppressing noise and interference, comprising:

obtaining a plurality of received signals from a plurality of microphones forming an array microphone, wherein the plurality of microphones include at least one omni-directional microphone and at least one uni-directional microphone;

providing first and second voice detection signals based on the plurality of received signals;

providing a reference signal based on the first voice detection signal and a first set of received signals selected from among the plurality of received signals;

providing a beam-formed signal based on the second voice detection signal, the reference signal, and a second set of received signals selected from among the plurality of received signals, wherein the beam-formed signal has noise and interference suppressed; and

suppressing additional noise and interference in the beam-formed signal to provide an output signal.

23. The method of claim 22, wherein the reference signal and beam-formed signal are provided using time-domain signal processing, and wherein the suppressing is performed using frequency-domain signal processing.